

15

secondary battery 3 with night period rate electric power. The residual capacity of the secondary battery is determined by subtracting a discharged capacity from an initial capacity. FIG. 9 shows the difference between residual capacity indication and actual residual capacity. As is obvious from FIG. 9, the difference increases as the number of charge and discharge cycles increases and, consequently, accurate residual capacity indication is impossible. FIG. 10 shows the charge and discharge cycle characteristics of batteries. As is obvious from FIG. 10, the capacities of a lead-acid battery, a nickel-cadmium battery, a nickel-metal hydride battery and a lithium battery decrease greatly as the number of charge and discharge cycles increases, and the lives of those batteries are in the range of 500 to 700 charge and discharge cycles.

As is apparent from the foregoing description, according to the present invention, the soundness of the battery can be secured, and charging and discharging are carried out efficiently. The secondary battery can be charged with inexpensive night period rate electric power in the night and the surplus electric power can be supplied to loads in the day time.

What is claimed is:

1. An electric vehicle comprising:

- a secondary battery (3);
- a secondary battery load (1) being connectable to said secondary battery (3); and

means (7) for determining an available discharge capacity of said secondary battery (3) such that electric power in the secondary battery (3) is discharged when a determined surplus residual electric power of said secondary battery (3) is within a predetermined range, prior to charging of said secondary battery (3).

2. An electric vehicle comprising:

- a connection unit (2) connectable to at least one load (5);
- means for connecting said connection unit (2) to a secondary battery (3), said secondary battery (3) being connectable to a secondary battery load (1);

16

means (7) for determining an available discharge capacity of said secondary battery (3); and

control means (6) for controlling said connection unit (2) on the basis of information received from the at least one load (5), such that electric power in the secondary battery (3) is discharged to a selected at least one of said at least one load (5) when a determined surplus residual electric power of said secondary battery (3) is within a predetermined range, prior to charging of said secondary battery (3).

3. An electric vehicle as claimed in claim 2, wherein said connection unit (2) is connectable to the at least one load (5) and to at least one electric power storage unit (4), wherein said control means (6) is for controlling said connection unit (2) on the basis of information received from the at least one load (5) and the at least one electric power storage unit (4).

4. An electric vehicle comprising:

- a connection unit (2) connectable to at least one electric power storage unit (4);

means for connecting said connection unit (2) to a secondary battery (3), said secondary battery (3) being connectable to a secondary battery load (1);

means (7) for determining an available discharge capacity of said secondary battery (3); and

control means (6) for controlling said connection unit (2) on the basis of information received from the at least one electric power storage unit (4), such that electric power in the secondary battery (3) is discharged to a selected at least one of said at least one electric power storage unit (4) when a determined surplus residual electric power of said secondary battery is within a predetermined range, prior to charging of said secondary battery (3).

* * * * *

5. A vehicle comprising:
a secondary battery;
a secondary battery load being connectable to said secondary
battery; and

means for determining an available discharge capacity of
said secondary battery such that electric power in the secondary
battery is discharged when a determined surplus residual electric
power of said secondary battery is within a predetermined range,
prior to charging of said secondary battery.

6. A vehicle as claimed in claim 5, wherein the vehicle is
an automobile.

7. A vehicle comprising:
a connection unit connectable to at least one load means for
connecting said connection unit to a secondary battery, said
secondary battery being connectable to a secondary battery load;
means for determining an available discharge capacity of
said secondary battery; and

control means for controlling said connection unit on the
basis of information received from the at least one load, such
that electric power in the secondary battery is discharged to a
selected at least one of said at least one load when a determined
surplus residual electric power of said secondary battery is
within a predetermined range, prior to charging of said secondary
battery.

8. A vehicle as claimed in claim 7, wherein the vehicle is an automobile.

9. A vehicle as claimed in claim 7, wherein said connection unit is connectable to the at least one load and to at least one electric power storage unit, wherein said control means is for controlling said connection unit on the basis of information received from the at least one load and the at least one electric power storage unit.

10. A vehicle as claimed in claim 9, wherein the vehicle is an automobile.

11. A vehicle comprising:
a connection unit connectable to at least one electric power storage unit;

means for connecting said connection unit to a secondary battery, said secondary battery being connectable to a secondary battery load;

means for determining an available discharge capacity of said secondary battery; and

control means for controlling said connection unit on the basis of information received from the at least one electric power storage unit, such that electric power in the secondary battery is discharged to a selected at least one of said at least one electric power storage unit when a determined surplus

12. A vehicle as claimed in claim 11, wherein the vehicle is an automobile.